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STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

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## ARE FEMALES LOSING THE ADVANTAGE OF LOW MORTALITY?

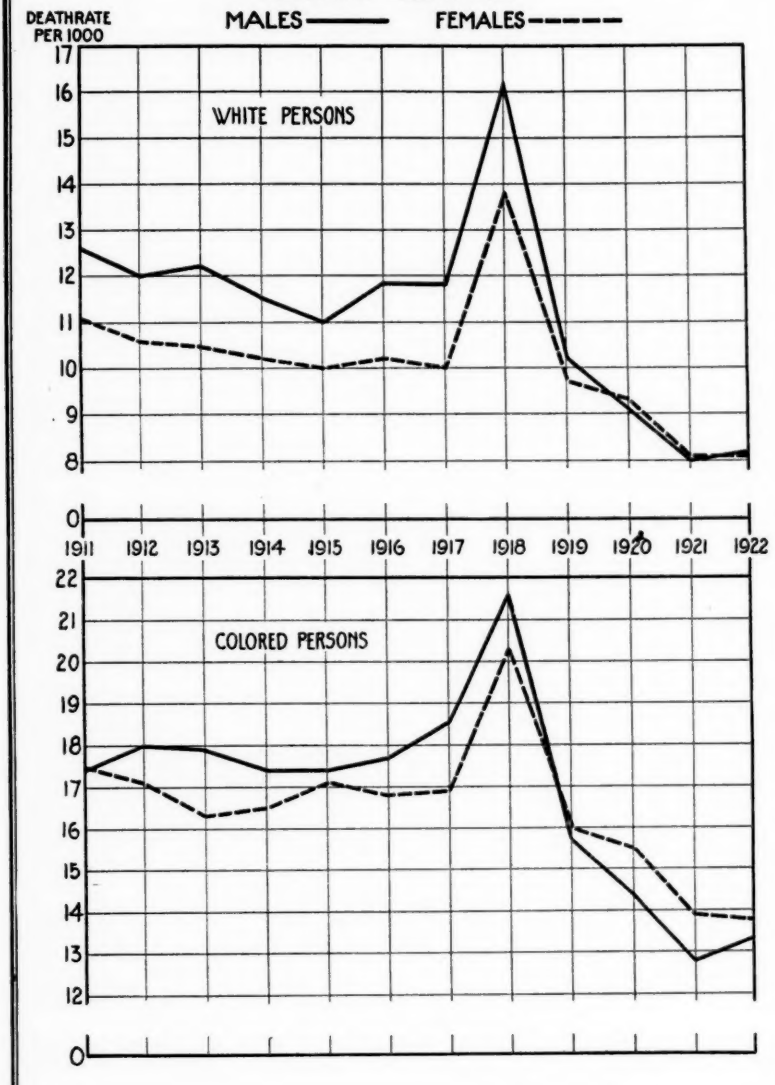
One of the supposed fixed relationships in the vital statistics of communities is the excess mortality of males over females. In the United States, the death rate of males has always been found to be higher than that of females at every age period from birth until death, and this condition has prevailed very generally throughout the civilized world. Only in an occasional country is there a fairly constant exception found, and then only at limited age periods of life.

Strangely enough, this relationship is apparently not as constant as we have learned to believe, for in recent years the mortality of females has actually been higher than that of males among the many millions of Metropolitan Industrial policy-holders in the United States and Canada. In 1911, the mortality of white males insured in this Company was more than 13 per cent. higher than among females. This condition continued up to and including 1918, the actual excess in the male mortality varying somewhat from year to year. In 1919, the excess dropped to about 5 per cent. In 1920, a reversal in the relationship finally occurred, the female mortality being 2.6 per cent. above that for males. In 1921, the female mortality was 1.2 per cent. above. In 1922, the condition was again changed to an excess of 1.2 per cent. in male mortality over that of females. Among the colored, as is shown in the accompanying graph, the differences between the death rates of the two sexes were never so strikingly marked; but, nevertheless, between 1912 and 1918 the excess of males was continuous, varying from 2 to about 10 per cent. Nineteen hundred and nineteen is the first year in which the mortality of females actually exceeded that for males, and this condition has continued since, including the year 1922.

# DEATHRATE PER 1,000
# MALES & FEMALES
# 1911 TO 1922

## METROPOLITAN LIFE INSURANCE CO.

INDUSTRIAL DEPARTMENT



It is significant that the occurrence we have described should have been suggested by the figures for a few years prior to the actual change, and that the reversal should appear among both white and colored lives. Very similar relationships in the mortality rates of males and females are apparently indicated in the figures for the Registration Area during the corresponding years. What these changes may mean it is still difficult to say. Light is thrown on the possible factors by consideration of the age periods of life where these changes were most pronounced. Thus, we find that among white persons the excess of female mortality was entirely limited to the ages 20 to 34 in 1921 and to 15 to 34 in 1920; among the colored it occurred between the ages of 10 and 34 in 1921, 10 and 24 in 1919, and 1 and 34 in 1920. After age 35, the male mortality has continued to be higher than the female throughout the rest of life. The ages are definitely those of child-bearing. They are also the ages at which the influenza epidemic made its greatest inroads and in which tuberculosis showed the most pronounced decreases during the last decade. It is entirely conceivable that each one of these three items has played an important part in the phenomenon under consideration. We have again and again, in recent years, called attention to the excessive mortality among women from the causes incidental to pregnancy and child-bearing. These excessive maternal death rates have shown the greatest reluctance toward improvement. The influenza epidemic, beginning with 1918, may well have been the exciting cause for much of this increased maternal mortality. It was noticed early in the influenza outbreaks that women at the child-bearing ages suffered excessively from the disease. An immensely increased mortality occured from the accidents of pregnancy and labor. This phenomenon has reappeared with virtually every new outbreak of influenza. Perhaps independently, there has also occurred a much greater decline from pulmonary tuberculosis among males than among females at these ages. It is still too early to say what this may mean, but there can be no question as to the greater reduction in tuberculosis mortality among males than among females, and this is strikingly marked in the ages under consideration.

We are unable, as yet, to make a more intensive analysis of the factors in this problem. It will be necessary to observe the conditions for a number of additional years and to note tendencies. In the meantime, we would suggest that students of public health observe the phenomenon in their respective areas and note whether

the conditions we have described have been general, or localized. It is possible, of course, that we are concerned here with only a temporary condition which may not occur again.

**Percentage, Male of Female Death Rate at Certain Age Periods. White and Colored Persons in Industrial Department, Metropolitan Life Insurance Company, 1919 to 1921***

| Age Period | White Persons | | | Colored Persons | | |
|---|---|---|---|---|---|---|
| | 1921 | 1920 | 1919 | 1921 | 1920 | 1919 |
| All Ages—1 and over. | *98.8* | *97.4* | 105.2 | *92.3* | *92.7* | *98.2* |
| 1 to 4..... | 112.5 | 110.8 | 110.5 | 108.4 | *96.4* | 115.1 |
| 5 to 9..... | 115.3 | 120.3 | 119.0 | 109.5 | *88.3* | 101.1 |
| 10 to 14..... | 114.6 | 118.9 | 105.5 | *95.1* | *75.9* | *88.8* |
| 15 to 19..... | 101.8 | *95.4* | 112.4 | *83.5* | *84.4* | *71.6* |
| 20 to 24..... | *92.6* | *82.9* | 117.3 | *70.4* | *74.5* | *95.2* |
| 25 to 34..... | *99.0* | *95.3* | 119.7 | *86.4* | *84.7* | 100.1 |
| 35 to 44..... | 126.3 | 123.7 | 136.3 | 101.3 | 106.2 | 107.7 |

*Age data for 1922 not available.

## MORTALITY RECORD OF THE FIRST QUARTER OF 1923

The death rate among the wage-earning population of the United States and Canada was higher during the first quarter of 1923 than for the same period of last year. Among white persons insured in the Industrial Department of the Metropolitan the rise was 8.9 per cent. and among the colored 11.5 per cent. The chief factor in the increase was the influenza epidemic which prevailed very generally over the whole country but was especially destructive in the southeastern states. This condition often terminated in pneumonia and also hastened the deaths of many persons who were already affected with tuberculosis, organic heart or Bright's disease. After the peak of the influenza epidemic passed, a pronounced decline was noted in the mortality from all these chronic diseases.

Among the epidemic diseases, the measles situation is the outstanding item. This disease has been widespread this year. A sufficient number of deaths has already occurred to make the 1923 measles death rate one of the highest in the history of the Industrial Department. Mortality from whooping cough also shows a pronounced increase over the winter of 1922, but the figure to date is not above the average whooping cough death rate of the last decade.

Diphtheria and scarlet fever show improvement over the first quarter of 1922 and pronounced declines as compared with 1921.

A decidedly encouraging feature of the health record of the quarter is the decline shown for diseases associated with pregnancy and childbirth. This is in evidence despite the prevalence of epidemic influenza and stands as the first instance in recent years when high mortality from influenza has not been accompanied by an increased death rate from abortions and miscarriages. The improvement has been common to both the white and colored policy-holders.

Fatal accidents will be the outstanding bad spot in the 1923 mortality record unless there is a pronounced improvement later in the year over conditions which obtained during the first quarter. Among the white policy-holders, accidental deaths increased 14 per cent. and among the colored, 21 per cent., as compared with the first quarter of 1922. The automobile fatality rate showed a pronounced rise indicating that the situation with respect to this, the most important cause of accidental death, is going from bad to worse.

During the quarter, 121 deaths were due to alcoholism. This corresponds to a death rate of 3.4 per 100,000. These figures may be compared with 62 such deaths in the first quarter of 1922, with a death rate of 1.8. The increase was, therefore, close to 100 per cent. During the *entire* year 1921, the deaths from this cause totalled only 122. Since the 1st of January, 1922, 414 deaths from alcoholism have occurred among Metropolitan Industrial policy-holders, of which 411 were distributed among 34 American states; the remaining 3 occurred in the Canadian Province of Ontario. There were also 224 deaths from cirrhosis of the liver (which is closely associated with alcoholism) during the first quarter of 1923. Deaths from wood and denatured alcohol poisoning, of which there were 36 during the year 1922 and 12 during the first quarter of 1923, are not included in the above figures.

The table on page 6 presents the death rates among white and colored policy-holders respectively, for the first quarters of 1923, 1922 and 1921.

**Death Rates per 100,000 Persons Exposed. First Quarters of 1921, 1922 and 1923 Compared. By Color for Principal Causes of Death. Industrial Department, Metropolitan Life Insurance Company. Premium-Paying Business**

| Cause of Death | Death rates per 100,000 persons exposed | | | | | |
|---|---|---|---|---|---|---|
| | White | | | Colored | | |
| | Jan. to Mar.'23 | Jan. to Mar.'22 | Jan. to Mar.'21 | Jan. to Mar.'23 | Jan. to Mar.'22 | Jan. to Mar.'21 |
| All causes of death | 1021.4 | 938.1 | 913.9 | 1633.7 | 1465.5 | 1408.0 |
| Typhoid fever | 2.9 | 2.6 | 3.9 | 6.2 | 5.3 | 3.4 |
| Measles | 11.5 | 3.8 | 5.6 | 7.6 | 1.2 | 1.8 |
| Scarlet fever | 6.7 | 8.7 | 11.3 | .7 | .5 | 3.6 |
| Whooping cough | 5.7 | 3.1 | 5.7 | 8.1 | 3.4 | 8.1 |
| Diphtheria and croup | 23.4 | 24.5 | 31.2 | 8.1 | 9.6 | 6.0 |
| Influenza | 70.4 | 41.2 | 12.6 | 133.8 | 81.1 | 29.2 |
| Meningococcus meningitis | .7 | .8 | 1.1 | 1.0 | .2 | .8 |
| Tuberculosis—All forms | 104.2 | 97.8 | 109.3 | 242.2 | 231.1 | 272.1 |
| Tuberculosis of respiratory system | 96.4 | 89.5 | 99.1 | 223.8 | 216.1 | 253.1 |
| Tuberculosis of the meninges, etc. | 3.6 | 3.7 | 5.4 | 5.7 | 4.1 | 5.7 |
| Other forms of tuberculosis | 4.2 | 4.7 | 4.8 | 12.7 | 10.8 | 13.3 |
| Cancer | 71.3 | 72.1 | 71.0 | 66.6 | 70.3 | 65.6 |
| Diabetes | 21.5 | * | * | 16.7 | * | * |
| Cerebral hemorrhage; apoplexy | 68.8 | 67.6 | 64.9 | 107.5 | 99.4 | 92.9 |
| Organic diseases of the heart | 150.8 | 141.7 | 127.8 | 229.8 | 203.4 | 172.6 |
| Total respiratory diseases | 151.9 | 136.3 | 123.2 | 263.4 | 215.9 | 196.8 |
| Bronchitis | 8.6 | 8.2 | 7.3 | 11.7 | 13.2 | 13.5 |
| Bronchopneumonia | 47.5 | 43.4 | 37.9 | 61.4 | 51.3 | 49.5 |
| Pneumonia—Lobar and undefined | 84.9 | 75.7 | 67.9 | 175.8 | 137.4 | 120.5 |
| Other dis. of respiratory system | 10.9 | 8.9 | 10.1 | 14.6 | 14.0 | 13.3 |
| Diarrhea and enteritis | 5.6 | 7.0 | 10.1 | 7.9 | 11.6 | 10.4 |
| Under 2 years | 2.4 | 2.8 | 3.4 | 1.2 | 2.9 | 1.8 |
| 2 years and over | 3.2 | 4.2 | 6.7 | 6.7 | 8.7 | 8.6 |
| Acute nephritis | 5.6 | 5.9 | 5.6 | 14.3 | 15.4 | 18.7 |
| Chronic nephritis | 75.9 | 71.7 | 68.8 | 119.2 | 117.5 | 106.2 |
| Total puerperal state | 19.7 | 20.9 | 22.1 | 22.0 | 25.3 | 30.2 |
| Puerperal septicemia | 7.3 | 7.6 | 10.9 | 7.9 | 10.6 | 13.0 |
| Puerperal albuminuria and convulsions | 4.2 | 4.6 | 4.2 | 6.0 | 5.1 | 6.5 |
| Other dis. of puerperal state | 8.2 | 8.7 | 7.1 | 8.1 | 9.6 | 10.7 |
| Total external causes | 63.0 | 57.0 | 58.8 | 101.5 | 86.4 | 98.7 |
| Suicides | 7.4 | 7.1 | 7.5 | 4.3 | 5.1 | 6.2 |
| Homicides | 3.2 | 3.7 | 3.4 | 29.1 | 25.3 | 27.9 |
| Accidental and unspecified violence | 52.4 | 46.1 | 47.9 | 68.1 | 56.1 | 64.6 |
| Accidental drowning | 2.2 | 2.2 | 3.4 | 1.2 | 2.9 | 2.6 |
| Automobile accidents | 10.0 | 8.6 | 8.2 | 10.0 | 5.5 | 8.3 |
| All other and ill-defined causes of death | 162.0 | 175.4 | 180.8 | 277.1 | 288.1 | 290.8 |

*Not available.

## THE MORTALITY FROM HEAT AND SUNSTROKE

The greatest variations occur from year to year in the number of cases of and deaths from heat prostration and sunstroke. Their occurrence is dependent, obviously, upon conditions of atmospheric heat and humidity. When the summer months of any year are

featured by frequent and protracted periods of high temperature, there result relatively large numbers of both fatal and non-fatal heat strokes.

How great are the variations in the death rate from this cause in various years will be news to the average person. Few realize that fatal heat prostrations could be 33½ times as numerous in one year as in another. Yet this is precisely what has happened among the Industrial policy-holders of the Metropolitan Life Insurance Company during the period 1911 to 1922. In 1911, 6.7 policy-holders per 100,000 died from the effects of heat; while in the year 1920, only .2 per 100,000 died from this cause. For the United States Registration Area, rates are available for a period of 21 years (1900 to 1920 inclusive). Here there is even a larger margin between the maximum heat fatality rate, which was 12.8 per 100,000 in 1901, and the minimum, which was .3 in 1920. There were about 43 times as many deaths from heat and sunstroke per 100,000 population in the maximum as in the minimum year. For no other single cause has there been as marked variation in the death rate during the past two decades as for heat and sunstroke.

Heat fatalities register a much higher death rate among males than among females. This is inevitable because men are engaged in occupations which subject them more often to the hazards of heat. Colored persons have a higher death rate than whites and this cannot be ascribed to the fact that colored people are relatively more numerous in the South. Experience has shown that even in the Southern States, the heat prostration death rate of colored persons exceeds that for whites.

The fact is that the highest death rates from the effects of heat are *not* found, as might be supposed, in the Southern States. North and South Carolina, for example, show, year after year, very low death rates from this cause, and the figures for Kentucky, Tennessee and Virginia are well below the average for the Registration Area. The lowest rates usually prevail in the Mountain States, particularly in Colorado and Montana; in Washington on the Pacific Coast, and in Maine and Vermont of the New England States. The states which in most years show above-average rates are Michigan, Wisconsin, Indiana and Ohio in the East North Central region, particularly the first two; all of the Middle Atlantic States, New York, New Jersey and Pennsylvania; Connecticut and Rhode Island in New England; Maryland in the South Atlantic region and Missouri in the West North Central section.

Comparison of the figures year after year shows clearly that the death rate from this cause is very much higher in the cities than in the rural districts. This is unquestionably due to the environmental conditions that obtain for city workers and city dwellers as well as their lower resistance. Those engaged in agricultural pursuits are notably less subject to the effects of heat.

Mortality from this cause has a very decided age incidence. Infants are particularly susceptible and elderly people are even more so. Almost one-half of the deaths from heat and sunstroke are those of persons over fifty years of age. It is obvious that during the heated season nothing should be left undone to protect infants from exposure and to give all possible attention to their diet. Older persons should guard as much as possible, not only against exposure to high temperatures, but against over-activity during the summer months.

### Correction of Smallpox Data, April, 1923, BULLETIN.

In the table on page two of our April STATISTICAL BULLETIN, the data recorded under "Lansing, Michigan" related not to the city but to the whole State. With this record deleted, the totals in the table should read:

| AREA | CASES | | | DEATHS | | | DEATHS PER 100 Cases | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1922 | 1921 | 1920 | 1922 | 1921 | 1920 | 1922 | 1921 | 1920 |
| TOTAL CITIES (275) | 8,709 | 26,977 | 30,328 | 478 | 301 | 193 | 5.5 | 1.1 | .6 |
| In United States (246) | 8,306 | 25,514 | 27,775 | 475 | 298 | 177 | 5.7 | 1.2 | .6 |
| In Canada (29) | 403 | 1,463 | 2,553 | 3 | 3 | 16 | .7 | .2 | .6 |
| SPECIAL CITIES (Total) | 1,617 | 2,777 | 2,102 | 460 | 235 | 4 | 28.4 | 8.5 | .2 |

This adjustment raises the case-fatality rate from 5.0 to 5.5 deaths per 100 cases in 1922 for the total cities, and from 16.8 to 28.4 for the group of "special cities" having a prevalence of virulent smallpox. Facts on smallpox prevalence in American States and Canadian provinces will be given in the June, 1923, BULLETIN.

## HEALTH RECORD FOR APRIL, 1923

The death rate of the Industrial policy-holders fell sharply in April, reflecting the seasonal decline that takes place at this time of

the year. In April we invariably have lower mortality than in March from pneumonia, influenza and the respiratory diseases, and almost always lower death rates for tuberculosis, cerebral hemorrhage, organic heart disease and chronic nephritis. There are no numerically important causes of death which, ordinarily, register increases in this month. Comparison with April of 1922, however, shows that the mortality was a little higher this year, the figures being 10.1 and 9.7 per 1,000.

High death rates are still being registered for measles and whooping cough. Despite the fact that the influenza rate declined more than half as compared with March, that disease accounted in April, for 545 deaths, while pneumonia is charged with 1,236. The combined death rate for the two causes was 155.9 per 100,000, and they were responsible for nearly one-sixth of all the deaths registered in April. Accidents, not only in April, but in each prior month this year have registered increased mortality over the corresponding months of last year. There were 126 deaths from automobile accidents in April as compared with 91 in March which corresponds to an increase in the death rate of 41.0 per cent. We expect an increase from this cause at this season of the year. The April, 1923, automobile fatality rate was 11.0 per 100,000 as compared with 8.8 for this month in 1922. As month follows month it becomes more and more probable that the automobile fatality rate of 1923 will be the highest ever recorded.

The death rate for the general population of the large cities of the United States in April was 14.5 per 1,000 estimated population. This marks a considerable decrease as compared with the March figure, 16.3, but, as among the insured lives, shows a rise over the rate for April, 1922, which was 13.7.

The widespread prevalence of measles is one of the outstanding morbidity items so far this year. Large increases were recorded in Alabama, Maryland, Michigan and North Carolina.

Influenza morbidity was lower in April than in March, and also lower than for the corresponding month of 1922. The decline was general throughout the country. Diphtheria was also less prevalent in April than in March.

Typhoid fever, smallpox and whooping cough increased slightly in April. Smallpox cases were more numerous, especially in Indiana, Iowa and Oregon. In Toledo, about 1,400 pupils in a school were vaccinated as the result of the discovery of a case of smallpox. A mild outbreak was reported at Standish, Maine. Considerable

increases in the incidence of whooping cough were reported from North Carolina and Kansas. Typhoid fever was epidemic in Cochrane, Ontario, and Mansonville, Quebec.

There were a number of important public health activities during April. In Connecticut, the State Bureau of Child Hygiene held a series of maternity and child welfare conferences. In Illinois, a health promotion and safety week was held and the State Senate passed the "Mason Bill" which makes it possible for either husband or wife to obtain a divorce if the other is infected with venereal disease. A permanent campaign for the eradication of malaria mosquitoes is under way in Belleville. In Columbia, S. C., a typhoid inoculation clinic was opened, and in Kentucky the Sanitary Engineer of the State Health Department in connection with a representative of the United States Public Health Service is making a survey to determine the cause and prevalence of typhoid fever in the city of Covington and adjacent territory. The Dallas, Texas, Child Guidance Clinic gave a reception which was attended by more than 300 persons. This is the third of eight demonstration clinics to be established in various parts of the country by the Commonwealth Fund of New York in cooperation with the National Committee for Mental Hygiene. The purpose is the study of juvenile delinquency. Yale University announced the establishment of the first university undergraduate school of nursing in the United States, the funds for which are provided by the Rockefeller Foundation.

The table below shows the mortality among Industrial policyholders for April, 1923; March, 1923; April, 1922, and for the year 1922.

## METROPOLITAN LIFE INSURANCE COMPANY.

### Death Rates per 100,000 for Principal Causes, Premium-Paying Business in Industrial Department. (Annual Basis)

MONTHS OF MARCH AND APRIL, 1923, AND OF APRIL, 1922

| CAUSES OF DEATH | RATE PER 100,000 LIVES EXPOSED | | | |
|---|---|---|---|---|
| | Apr., 1923 | Mar., 1923 | Apr., 1922 | Year 1922† |
| TOTAL—ALL CAUSES | 1008.4 | 1199.4 | 969.4 | 877.2 |
| Typhoid fever | 3.9 | 3.3 | 3.6 | 5.6 |
| Measles | 12.5 | 13.6 | 7.6 | 4.3 |
| Scarlet fever | 6.5 | 6.9 | 5.9 | 4.8 |
| Whooping cough | 6.8 | 7.3 | 2.1 | 2.6 |
| Diphtheria | 12.3 | 18.2 | 12.7 | 17.8 |
| Influenza | 47.7 | 100.4 | 41.1 | 21.5 |
| Tuberculosis (all forms) | 119.0 | 124.2 | 124.8 | 113.4 |
| Tuberculosis of resp'y system | 109.0 | 114.8 | 113.9 | 102.9 |
| Cancer | 74.6 | 74.2 | 66.8 | 71.5 |
| Diabetes mellitus | 21.3 | 22.0 | * | 17.0 |
| Cerebral hemorrhage | 65.9 | 72.9 | 66.8 | 62.4 |
| Organic diseases of heart | 139.3 | 174.6 | 142.3 | 126.0 |
| Pneumonia (all forms) | 108.2 | 164.3 | 102.4 | 73.3 |
| Other respiratory diseases | 15.7 | 23.8 | 15.0 | 13.6 |
| Diarrhea and enteritis | 8.7 | 5.2 | 5.5 | 10.7 |
| Bright's disease (chronic nephritis) | 78.3 | 88.2 | 74.8 | 69.9 |
| Puerperal state | 18.0 | 19.1 | 18.3 | 18.9 |
| Suicides | 7.0 | 7.0 | 9.0 | 7.4 |
| Homicides | 6.6 | 5.9 | 4.2 | 6.2 |
| Other external causes (excluding suicides and homicides) | 55.1 | 54.6 | 45.0 | 57.7 |
| Traumatism by automobile | 11.0 | 7.8 | 8.8 | 13.5 |
| All other causes | 201.1 | 213.7 | 221.8 | 172.6 |

*Not available. †Based on provisional estimate of lives exposed to risk in 1922.

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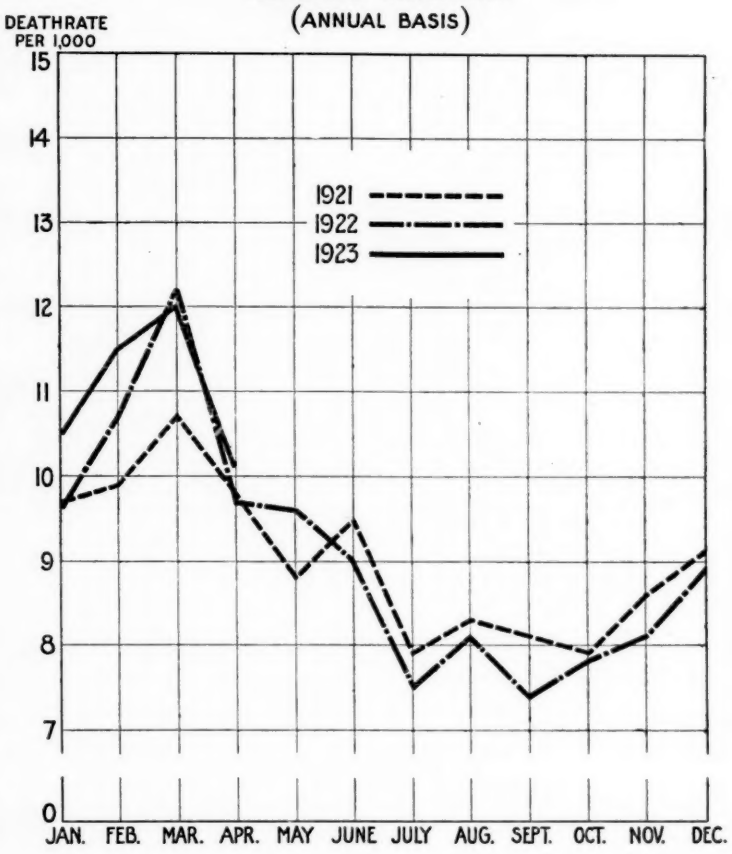
# DEATHRATE PER 1,000
## *in* SPECIFIED MONTHS *of*
## 1921-1922-1923

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)




| | 1921 | 1922 | 1923 |
|---|---|---|---|
| JAN. | 9.7 | 9.6 | 10.5 |
| FEB. | 9.9 | 10.7 | 11.5 |
| MAR. | 10.7 | 12.2 | 12.0 |
| APR. | 9.8 | 9.7 | 10.1 |
| MAY | 8.8 | 9.6 | |
| JUNE | 9.5 | 9.0 | |

| | 1921 | 1922 | 1923 |
|---|---|---|---|
| JULY | 7.9 | 7.5 | |
| AUG. | 8.3 | 8.1 | |
| SEPT. | 8.1 | 7.4 | |
| OCT. | 7.9 | 7.8 | |
| NOV. | 8.6 | 8.1 | |
| DEC. | 9.1 | 8.9 | |



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